

N61165.AR.004419
CNC CHARLESTON
5090.3a

SAMPLING AND ANALYSIS PLAN FOR ZONE F FUEL DISTRIBUTION SYSTEM AREA 16
CNC CHARLESTON SC
11/1/2002
CH2M HILL

**SAMPLING AND ANALYSIS PLAN
FOR
ZONE F; Fuel Distribution System: Area 16
SCDHEC No: 02098**

**Charleston Naval Complex
North Charleston, South Carolina**

**SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND**

Contract Number N62467-99-C-0960

November 2002

**SAMPLING AND ANALYSIS PLAN
FOR
Zone F; Fuel Distribution System: Area 16**

**Charleston Naval Complex
North Charleston, South Carolina**

**Submitted to:
Southern Division
Naval Facilities Engineering Command
2155 Eagle Drive
Charleston, South Carolina 29406**

**Submitted by:
CH2M-JONES, LLC.
Charleston Naval Complex
1849 Avenue F
North Charleston, South Carolina 29405**



J.A. JONES
ENVIRONMENTAL
SERVICES



CH2MHILL

Contract Number: N62467-99-C-0960

November 2002

ACRONYMS

bls	below land surface
BTEX	benzene, toluene, ethylbenzene and xylenes
BRAC	Defense Base Realignment and Closure Act
CAP	Corrective Action Plan
CNC	Charleston Naval Complex
COC	Chemical of Concern
DPT	Direct Push Technology
EISOPQAM	Environmental Investigations Standard Operating Procedures and Quality Assurance Manual
GEL	General Engineering Laboratories
µg/kg	microgram per kilogram
µg/L	microgram per liter
NAVFAC	Naval Facilities Engineering Command
OVA	Organic Vapor Analyzer
PAH	Polycyclic Aromatic Hydrocarbons
QA	Quality Assurance
QC	Quality Control
RA	Rapid Assessment
RAR	Rapid Assessment Report
RBSL	Risk-Based Screening Level
RCRA	Resource Conservation Recovery Act
RFI	RCRA Facility Investigation
SCDHEC	South Carolina Department of Health and Environmental Control
SOUTHDIV	Southern Division Naval Facilities Engineering Command
SPORTENDETHASN	Supervisor of Ship Building, Conversion and Repair, United States Navy, Portsmouth Virginia, Environmental Detachment Charleston
SSTL	Site-Specific Target Level
US EPA	United States Environmental Protection Agency
UST	Underground Storage Tank

TABLE OF CONTENTS

Section	Page
ACRONYMS	iii
1.0 INTRODUCTION	1
1.1 General Site Description	1
1.2 Site Background	1
2.0 PROPOSED SAMPLING PLAN	2
2.1 Sampling and Analysis Plan.....	2
2.2 Groundwater Collection.....	2
2.3 Surveying	2
2.4 Soil Samples	2
2.5 Reporting	2
2.6 Equipment Decontamination	3
2.7 Sample Handling	3
2.8 Quality Control.....	3
2.9 Field Quality Assurance / Quality Control (QA/QC)	4
2.10 Record Keeping	4
3.0 SITE MANAGEMENT AND BASE SUPPORT	5
4.0 REFERENCES	6
FIGURES	
1	Site Location Map
2	Monitoring Well Locations
3	Proposed Soil Sample Locations

1.0 INTRODUCTION

This Sampling and Analysis Plan (SAP) has been prepared by CH2M-JONES, LLC. The plan is designed for Fuel Distribution System Area 16, located across the road from and west of building 1172 at the Charleston Naval Complex (CNC), Charleston, South Carolina. This site contains part of a Fuel Distribution System (FDS), which is no longer in use. Further investigation of the potential petroleum groundwater contamination and resulting further sampling for both groundwater and subsurface soil.

Originally this site was under the RCRA program as AOC 709, however a letter dated 22 January 2002, transferred the site to the UST program.

The South Carolina Department of Health and Environmental Control (SCDHEC) has designated this site as Identification Number:02098.

1.1 General Site Description

The CNC is in the city of North Charleston, on the west bank of the Cooper River in Charleston County, South Carolina, as shown on **Figure 1**. This installation consists of two major areas, an undeveloped dredge materials area on the east bank of the Cooper River on Daniel Island in Berkeley County, and a developed area on the west bank of the Cooper River. The developed portion of the base is on the peninsula bounded on the west by the Ashley River and on the east by the Cooper River.

The site is located within the developed portion of the base. The area surrounding CNC is "mature urban," having long been developed with commercial, industrial, and residential land use. Commercial areas are primarily west of CNC; industrial areas are primarily to the north of the base along Shipyard Creek.

1.2 Site Background

The CNC began operations in 1901, when the Navy acquired the property. In 1993, the CNC was added to the list of bases scheduled for closure under the Defense Base Realignment and Closure Act (BRAC). BRAC regulates the closure of the base and transition of the property back to the community. With the scheduled closure of the base, environmental cleanup has proceeded to make the property available for redevelopment after closure.

Area 16 is associated with the fuel Distribution System (FDS), which could potentially impact the west side of Hobson Avenue, across the road from and west of building 1172. The Cooper River lies approximately 1,200 feet to the east. To investigate potential petroleum groundwater contamination, three shallow monitoring wells were installed in this area: two along the west side Hobson Avenue in the area described, and one to the south in a grassy median between Borie Street and Ballfield 1405.

2.0 PROPOSED SAMPLING PLAN

This SAP proposes additional assessment of the groundwater and soil in the vicinity of Fuel Distribution System. Area 16. Based upon previous data, three existing wells will be sampled and two soil samples will be collected

Based on the historical analytical results CH2M-Jones, LLC recommends that a sampling plan be implemented to confirm that groundwater and or soils in this area have not been impacted by the former operations. If analytical results indicate that levels are below the RBSLs, a No Further Action may be recommended for this site

2.1 Sampling and Analysis Plan

Groundwater will be collected from three existing wells. The samples collected will be analyzed for VOCs, SVOCs, Arsenic, Total Iron, and Dissolved Iron, in accordance with the *South Carolina Risk-Based Corrective Action for Petroleum Releases*.

Two soil samples will also be collected in the vicinity of the Fuel Distribution System. The samples collected will be analyzed for VOCs and SVOCs in accordance with the *South Carolina Risk-Based Corrective Action for Petroleum Releases*.

All sampling procedures will be conducted in accordance with EPA EISOPQAM and Ensafé/Allen & Hoshall, Comprehensive Sampling and Analysis Plan, 1996.

2.2 Groundwater Collection

A total of three existing monitoring wells (FDSGW16A, FDSGW16B, and FDSGW16C) will be sampled (See **Figure 2** for locations). Groundwater is typically located between 4-5 feet below land surface (bls) in this area so samples will be collected approximately 12 feet bls

2.3 Surveying

All new sampling locations will be surveyed after collection.

2.4 Soil Samples

Two soil samples will be collected at two intervals each. The intervals will be from (0-1) feet below land surface (bls) and (3-5) feet below land surface (bls) (See **Figure 3** for locations).

2.5 Reporting

A Groundwater Monitoring Report will be submitted to SCDHEC following the sampling event. The report will summarize and include copies of field and laboratory analytical data and COC distribution and trends

2.6 Equipment Decontamination

If needed, all drilling equipment, augers, well casing and screens, and soil and groundwater sampling equipment involved in field sampling activities will be decontaminated according to the EPA EISOPQAM

2.7 Sample Handling

Sample handling will be conducted in accordance to the following references: EPA EISOPQAM, Code of Federal Regulations 136, 1990, and EPA Users Guide to Contract Laboratory Program, 1988. The following forms will be completed for packing/shipping process: sample labels, chain-of-custody labels, appropriate labels applied to shipping coolers, and chain-of-custody forms

2.8 Quality Control

In addition to periodic calibration of field equipment and the completions of the appropriate documentation, quality control (QC) samples will be collected during sampling events. QC samples may include field blanks, field duplicates, and trip blanks. Definitions of each can be found below as described by the EPA EISOPQAM:

- **Field Blank:** A sample collected using organic-free water, which has been run over/through sample collection equipment. These samples are used to determine if contaminants have been introduced by contact of the sample medium with sampling equipment. Equipment field blanks are often associated with collecting rinse blanks of equipment that has been field cleaned.
- **Field Duplicates:** Two or more samples collected from a common source. The purpose of a duplicate sample is to estimate the variability of a given characteristic or contamination associated with a population.
- **Trip Blank:** A sample, which is prepared prior to the sampling event in the actual container and is stored with the investigative samples throughout the sampling event. They are often packaged for shipment with the other samples and submitted for analysis. At no time after their preparation are trip blanks to be opened before they reach the laboratory. Trip blanks are used to determine if samples were contaminated during storage and/or transportation back to the laboratory (a measure of sample handling variability resulting in positive bias in contaminant concentration). If samples are to be shipped, trip blanks are to be provided with each shipment but not for each cooler.

2.9 Field Quality Assurance / Quality Control (QA/QC)

All sampling procedures will be conducted in accordance with EPA EISOPQAM

QA/QC specifications for selected field measurements are summarized below

Analysis	Control Parameter	Control Limit	Corrective Action
Air Monitoring	Check Calibration of OVA daily	Calibrate to manufactures specifications	Recalibrate. If unable to calibrate, replace
pH of water	Continuing calibration check of pH 7.0 buffer	pH = 7.0	Recalibrate. If unable to calibrate, replace electrode
Specific Conductance of water	Continuing calibration check of standard solution	> 1% of standard	Recalibrate

2.10 Record Keeping

In addition to required sampling documentation, standardized forms, log sheets and logbooks will be completed during all field activities

3.0 SITE MANAGEMENT AND BASE SUPPORT

Throughout the investigation activities, work on the CNC will be coordinated through SOUTHDIV and SCDHEC

The primary contacts for each are as follows:

1. SOUTHDIV point of contact
Gabe Magwood
Southern Division Engineering Command
2155 Eagle Drive
North Charleston, SC 29406
(843) 820-7307
2. SOUTHDIV point of contact
Tony Hunt
Southern Division Engineering Command
2155 Eagle Drive
North Charleston, SC 29406
(843) 820-5525
3. SCDHEC point of contact
Michael Bishop
South Carolina Department of Health and Environmental Control
2600 Bull Street
Columbia, SC 29201
(843) 898-4300

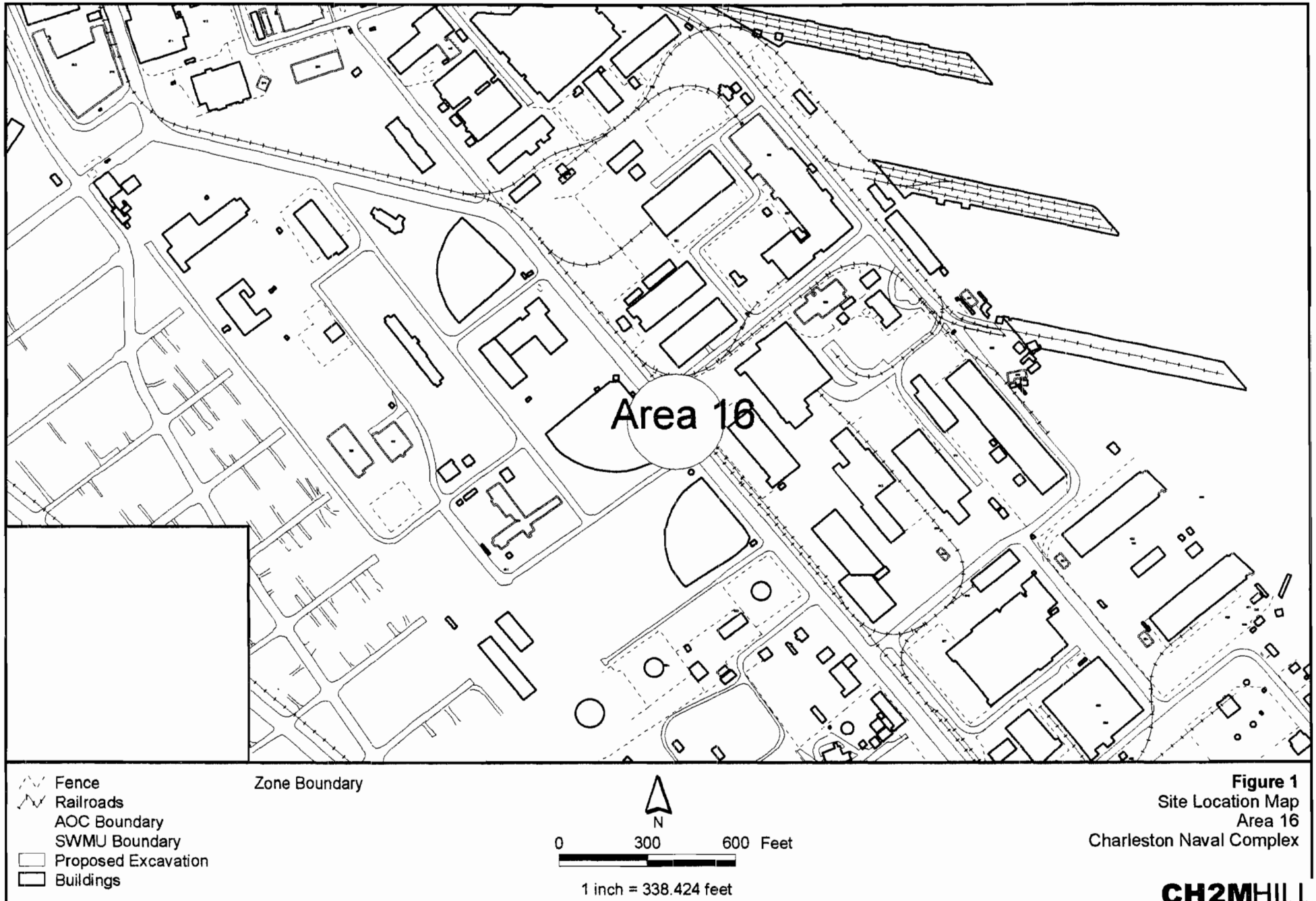
4.0 REFERENCES

South Carolina Department of Health and Environmental Control 2001. Risk-Based Corrective Action

United States Environmental Protection Agency. 1996. EPA Environmental Investigations Standard Operating Procedures for Quality Assurance Manual.

SPORTENVDETHASN. 1996. UST Assessment Report for NS 2A.

NOTE: Original figure created in color



NOTE: Original figure created in color

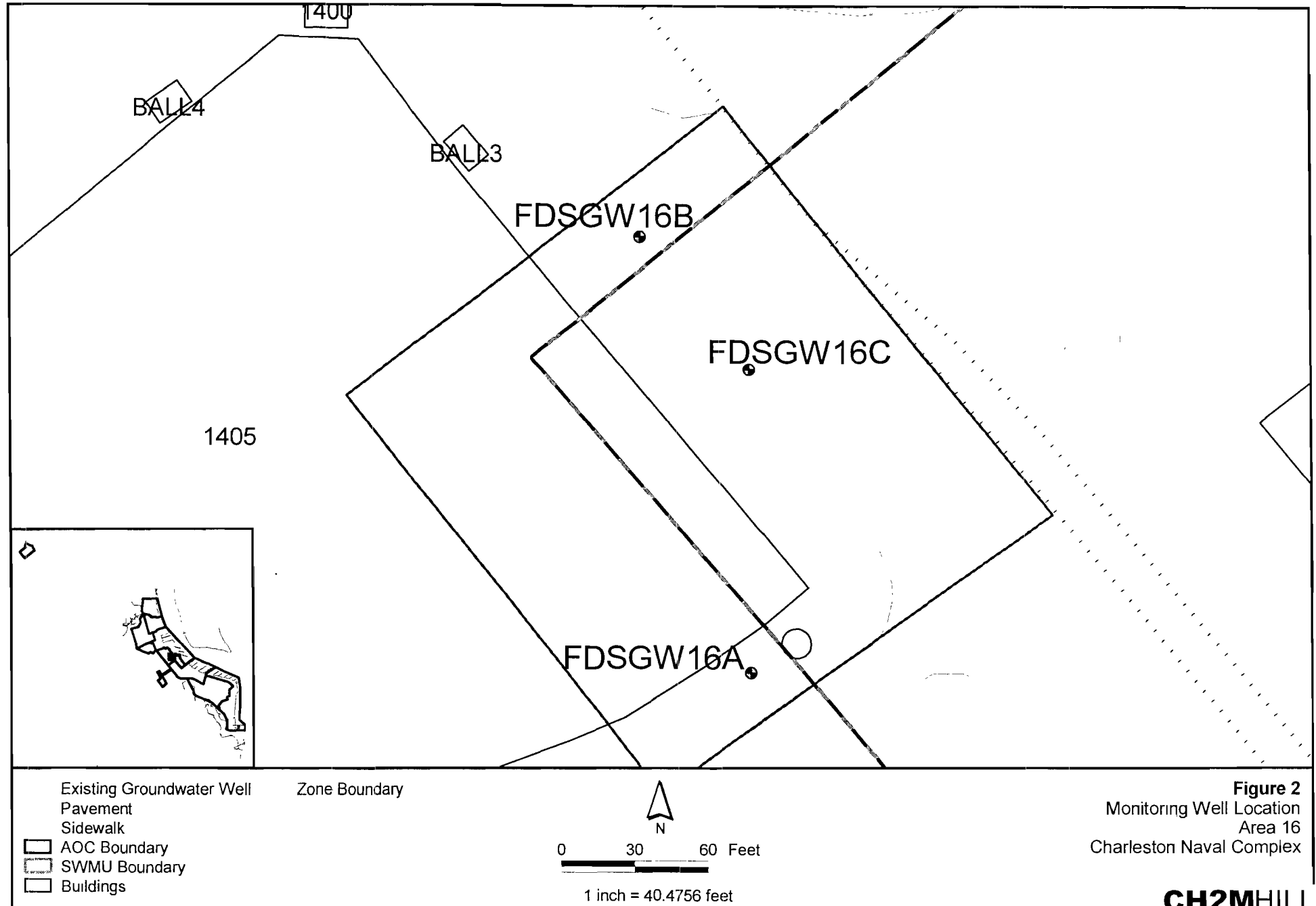


Figure 2
Monitoring Well Location
Area 16
Charleston Naval Complex

CH2MHILL

NOTE: Original figure created in color

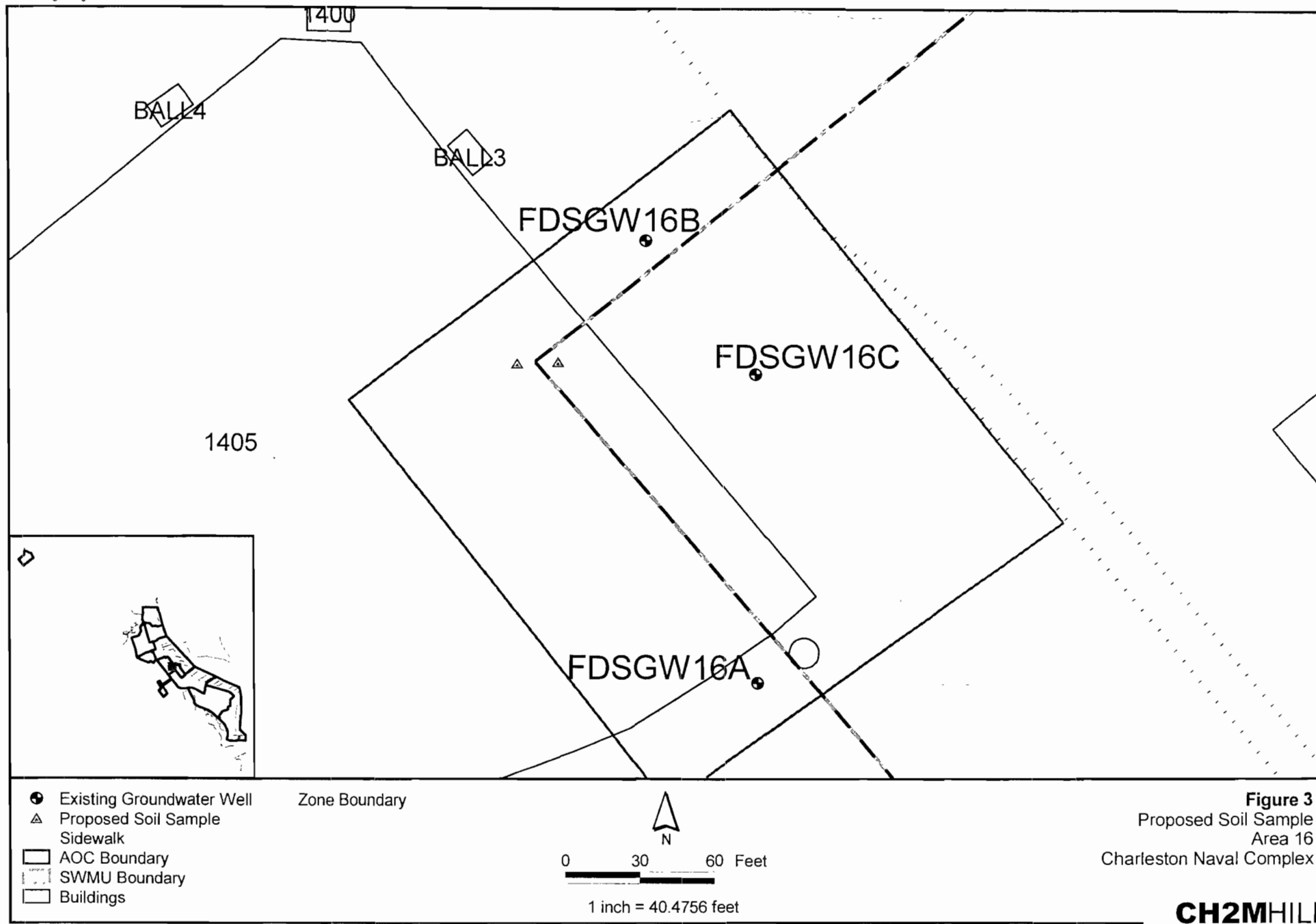


Figure 3
Proposed Soil Sample
Area 16
Charleston Naval Complex

CH2MHILL